Claims

1. Method for determining a selected position of a mobile communications device in a communications network with at least one first base station set up for a first communication with the mobile communications device by means of first communications signals, using a non-linear communications model with a deterministic component and a stochastic component,

- the deterministic component of which describes a dependency between communications signals of a base station and positions of the mobile communications device and

    -the stochastic component of which describes an uncertainty of the deterministic component.

- in which, using the first communications signal of the first base station belonging to the selected position and the non-linear communications model, the selected position is determined,

- with a non-linear Bayesian filter technique being applied for the determination, by which a possible location area of the selected position is determined, from which the selected position is determined.

2. Method in accordance with claim 1,
in which at least one second base station, set up for a second communication with the mobile communications device by means of second communications signals is used, with the selected position being determined by using the first communications signal belonging to the selected position and/or the second communications signal belonging to the selected position and the non-linear communications model.

3. Method in accordance with claim 1 or 2,
in which, by using the first and/or of the second

communications signal, one and/or a number of distance-
dependent parameters is or are determined which depends or
depend on the distance between the mobile communications
device and one of the base stations and through the use of
which the possible location area is determined.

4. Method in accordance with one of the previous claims,
in which the uncertainty of the deterministic component is an
uncertainty of the communications signals, especially a
measurement noise, and/or an uncertainty of the dependency,
especially a uncertainty of the communications model.

5. Method in accordance with one of the previous claims,
in which the first communications signal belonging to the
selected position is time-dependent and/or is measured for a
point in time k.

6. Method in accordance with one of the previous claims,
in which the non-linear Bayesian filter technique is applied
iteratively.

7. Method in accordance with one of the previous claims,
in which a Gaussian mixed filter algorithm or a Kalman filter,
especially an Extended Kalman filter, is used as the non-
linear Bayesian filter technique.

8. Method in accordance with claim 7,
in which the Gaussian mixed filter algorithm is a Prior
Density Splitting Mixture Estimator (PDSME).

9. Method in accordance with one of the previous claims,
in which a user model is used which describes a movement of
the mobile communications device.

10. Method in accordance with claim 9,
in which, using a user model, the movement of the mobile

communications device is limited for a time step.

11. Method in accordance with claim 9 or 10,
in which, using the user model, an estimated position for the
selected position is determined.

12. Method in accordance with claim 11,
in which the estimated position is determined by applying the
non-linear Bayesian filter technique.

13. Method in accordance with claim 11 or 12,
in which the estimated position is used as a starting value
for the determination of the possible location area of the
selected position through the application of the non-linear
Bayesian filter technique.

14. Method in accordance with one of the previous claims,
in which the communications network is a WLAN, GSM or DECT
network.

15. Method in accordance with one of the previous claims,
in which a characteristic value of the possible location area,
especially a focal point or an expected value of the possible
location area is used as the selected position of the mobile
communications device.

16. Method in accordance with one of the previous claims, used
for localization of a mobile telephone in a digital cellular
mobile radio network, especially in a GSM network,
where the mobile communications device is the mobile
telephone, the first base station is a call-controlling base
station in the mobile radio network.

17. Configuration for determining a selected position of a
mobile communications device in a communications network with
at least one first base station set up for a first

communication with the mobile communications device by means
of first communications signals, using a non-linear
communications model with a deterministic component and a
stochastic component,

- the deterministic component of which describes a
dependency between communications signals of a base
station and positions of the mobile communications
device and,
- the stochastic component of which describes an
uncertainty of the deterministic component.
- with a position-determining unit which is set up so that, by
using the first communications signal of the first base
station belonging to the selected position and the non-
linear communications model the selected position is
determined.
- with a non-linear Bayesian filter technique being applied
for the determination, by which a possible location area of
the selected position is determined, from which the selected
position is determined.

18. Computer program product with program code means, to
execute all steps according to claim 1 when the program is
executed on a computer.

19. Computer program product with program code means in
accordance with claim 18, which are stored on a computer-
readable data medium.

20. Computer program product with program means stored on a
machine-readable data medium, to perform all steps according
to claim 1, when the program is executed on a computer.